

signals; and

a controller for controlling said delay adjuster according to said modulation-phase detected by said detector, wherein said detector comprises:

an optical filter for passing an optical signal having a reference wavelength;

a circuit for regenerating a reference clock according to said optical signal passed through said optical filter;

a tunable optical filter for passing an optical signal having an arbitrary wavelength;

a circuit for regenerating a clock according to said optical signal passed through said tunable optical filter; and

a phase comparator for comparing the phases of said reference clock and said clock.

*24* (AS ONCE AMENDED) An optical signal processing device comprising:

an optical demultiplexer having an input port and a plurality of output ports, said input port being adapted to accept WDM signal light obtained by wavelength division multiplexing a plurality of optical signals having different wavelengths;

*Q1* an optical multiplexer having an output port and a plurality of input ports;

a plurality of optical paths for respectively connecting said plurality of output ports and said plurality of input ports;

*cont.* at least one delay adjuster provided on at least one of said plurality of optical paths;

a detector for detecting the modulation-phase of at least one of said plurality of optical signals; and

a controller for controlling said delay adjuster according to said modulation-phase detected by said detector, wherein said detector comprises:

a tunable optical filter for passing an optical signal having an arbitrary wavelength;

a circuit for regenerating first and second clocks according to a first optical signal having a first wavelength passed through said tunable optical filter and a second optical signal having a second wavelength passed through said tunable optical filter, respectively; and

a phase comparator for comparing the phases of said first and second clocks.

*35* (AS ONCE AMENDED) An optical signal processing device comprising:

an optical demultiplexer having an input port and a plurality of output ports, said input

port being adapted to accept WDM signal light obtained by wavelength division multiplexing a plurality of optical signals having different wavelengths;

an optical multiplexer having an output port and a plurality of input ports;

a plurality of optical paths for respectively connecting said plurality of output ports and said plurality of input ports;

at least one delay adjuster provided on at least one of said plurality of optical paths;

a detector for detecting the modulation-phase of at least one of said plurality of optical signals; and

a controller for controlling said delay adjuster according to said modulation-phase detected by said detector, wherein said detector comprises:

an optical filter for passing an optical signal having a reference wavelength;

a circuit for generating a reference clock according to said optical signal passed through said optical filter;

a tunable optical filter for passing an optical signal having an arbitrary wavelength;

a circuit for regenerating a clock according to said optical signal passed through

said tunable optical filter; and

a phase comparator for comparing the phases of said reference clock and said

clock.

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(AS ONCE AMENDED) An optical signal processing device comprising:

an optical demultiplexer having an input port and a plurality of output ports, said input port being adapted to accept WDM signal light obtained by wavelength division multiplexing a plurality of optical signals having different wavelengths;

an optical multiplexer having an output port and a plurality of input ports;

a plurality of optical paths for respectively connecting said plurality of output ports and said plurality of input ports;

at least one delay adjuster provided on at least one of said plurality of optical paths;

a detector for detecting the modulation-phase of at least one of said plurality of optical signals; and

a controller for controlling said delay adjuster according to said modulation-phase detected by said detector, wherein said detector comprises:

a pulse light source for generating reference pulse light;

8

Q1 cont. an optical filter for passing an optical signal having an arbitrary wavelength; and  
 a gain saturation device for accepting said optical signal passed through said optical filter and said reference pulse light;  
 said controller comprising a circuit for controlling said delay adjuster so that the average power of light output from said gain saturation device is reduced.

7 8. (AS ONCE AMENDED) An optical signal processing device comprising:  
 an optical demultiplexer having an input port and a plurality of output ports, said input port being adapted to accept WDM signal light obtained by wavelength division multiplexing a plurality of optical signals having different wavelengths;  
 Q2 an optical multiplexer having an output port and a plurality of input ports;  
 a plurality of optical paths for respectively connecting said plurality of output ports and said plurality of input ports;  
 at least one delay adjuster provided on at least one of said plurality of optical paths;  
 a detector for detecting the modulation-phase of at least one of said plurality of optical signals; and  
 a controller for controlling said delay adjuster according to said modulation-phase detected by said detector, wherein said detector comprises:  
 a first optical filter for passing an optical signal having a first wavelength;  
 a second optical filter for passing an optical signal having a second wavelength;  
 and  
 a gain saturation device for accepting said optical signal passed through said first optical filter and said optical signal passed through said second optical filter;  
 said controller comprising a circuit for controlling said delay adjuster so that the average power of light output from said gain saturation device is reduced.

8 10. (AS ONCE AMENDED) An optical signal processing device comprising:  
 an optical demultiplexer having an input port and a plurality of output ports, said input port being adapted to accept WDM signal light obtained by wavelength division multiplexing a plurality of optical signals having different wavelengths;  
 an optical multiplexer having an output port and a plurality of input ports;  
 a plurality of optical paths for respectively connecting said plurality of output ports and

said plurality of input ports;

at least one delay adjuster provided on at least one of said plurality of optical paths;

a detector for detecting the modulation-phase of at least one of said plurality of optical signals; and

a controller for controlling said delay adjuster according to said modulation-phase detected by said detector, wherein said detector comprises:

A2

a pulse light source for generating reference pulse light;

an optical filter for passing an optical signal having an arbitrary wavelength; and

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a saturable absorption device for accepting said optical signal passed through said optical filter and said reference pulse light;

said controller comprising a circuit for controlling said delay adjuster so that the average power of light output from said saturable absorption device is increased.

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(AS ONCE AMENDED) An optical signal processing device comprising:

an optical demultiplexer having an input port and a plurality of output ports, said input port being adapted to accept WDM signal light obtained by wavelength division multiplexing a plurality of optical signals having different wavelengths;

an optical multiplexer having an output port and a plurality of input ports;

A3

a plurality of optical paths for respectively connecting said plurality of output ports and said plurality of input ports;

at least one delay adjuster provided on at least one of said plurality of optical paths;

a detector for detecting the modulation-phase of at least one of said plurality of optical signals; and

a controller for controlling said delay adjuster according to said modulation-phase detected by said detector, wherein said detector comprises:

a first optical filter for passing an optical signal having a first wavelength;

a second optical filter for passing an optical signal having a second wavelength;

and

a saturable absorption device for accepting said optical signal passed through said first optical filter and said optical signal passed through said second optical filter;

said controller comprising a circuit for controlling said delay adjuster so that the average power of light output from said saturable absorption device is increased.

14